

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

<b>A. SCIENCE CONNECTIONS</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<i>By the end of Grade 12 students will:</i>	<i>By the end of Grade 12 students will:</i>	
A.12.1 Apply the underlying themes of science to develop defensible visions of the future	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.3 Explain the impact of climate change on existing agricultural systems E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	
A.12.2 Show how conflicting assumptions about science themes lead to different opinions and decisions about evolution, health, population, longevity, education, and use of resources, and show how these opinions and decisions have diverse effects on an individual, a community, and a country, both now and in the future	D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.4 Explore traditional and nontraditional food, fiber, and ornamental horticultural jobs/careers and identify the necessary skills, aptitudes, and abilities E.12.2 Analyze benefits, costs, and consequences of land use E.12.3 Explain the impact of climate change on existing agricultural systems E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1 Identify careers related to food science. 2 Describe the education and skills needed for a career in food science. 3 Identify the two main occupations involved in food science and the food science industry. 1 Identify food preference patterns and how they may differ between cultures. 2 Explain how income and culture impact food preference patterns. 3 Identify trends in food preference patterns. 4 Rank selected countries on per capita spending on food. Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating? The Case of the Unhealthy Diet Scenario
A.12.3 Give examples that show how partial systems,	A.12.2 Understand the variety, complexity, and size of the	1 Explain the concept of food science.

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

models, and explanations are used to give quick and reasonable solutions that are accurate enough for basic needs	<p>agricultural industry in the world</p> <p>B.12.1 Apply knowledge of technology to identify and solve problems</p> <p>D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products</p>	<p>2 Explain the importance of food science.</p> <p>3 Identify the segments of the food industry.</p> <p>1 Identify careers related to food science.</p> <p>2 Describe the education and skills needed for a career in food science.</p> <p>3 Identify the two main occupations involved in food science and the food science industry.</p> <p>1 Describe the food service industry.</p> <p>2 Explain how food science and the food service industry are related.</p> <p>3 Identify trends related to the food service industry.</p> <p>1 Explain the importance of nutrition.</p> <p>2 Identify and describe the six major nutrients needed for good nutrition.</p> <p>1 Explain how calories relate to nutrition.</p> <p>2 Explain claims made on food labels related to diet and health.</p> <p>3 Describe the Recommended Dietary Allowance (RDA).</p> <p>1 Describe methods of safely storing foods in the home.</p> <p>2 Identify potential food storage problems in homes.</p> <p>1 Describe methods of safely handling and preparing foods in the home.</p> <p>2 Describe the importance of cooking meats to the proper temperatures.</p> <p>3 Observe a meal being prepared in the home and identify potential safety issues.</p> <p>1 Describe the role of biotechnology in food science.</p> <p>2 Describe some future food products from improved crops.</p> <p>3 Describe the future of food-producing animals.</p>
---	--	--

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

A.12.4 Construct arguments that show how conflicting models and explanations of events can start with similar evidence	E.12.3 Explain the impact of climate change on existing agricultural systems E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	
A.12.5 Show how the ideas and themes of science can be used to make real-life decisions about careers, work places, life-styles, and use of resources	B.12.5 Explore various career opportunities in the food, fiber, and natural resources industries using available forms of technology D.12.4 Explore traditional and nontraditional food, fiber, and ornamental horticultural jobs/careers and identify the necessary skills, aptitudes, and abilities F.12.4 Research a career in agricultural business marketing and management	1 Identify careers related to food science. 2 Describe the education and skills needed for a career in food science. 3 Identify the two main occupations involved in food science and the food science industry.
A.12.6 Identify and replace inaccurate personal models and explanations of science-related phenomena using evidence learned or discovered	D.12.5 Describe how biotechnology can enhance food and fiber production E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	
A.12.7 Re-examine the evidence and reasoning that led to conclusions drawn from investigations, using the science themes	E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity	
<b>B. NATURE OF SCIENCE</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<i>By the end of Grade 12 students will:</i>	<i>By the end of Grade 12 students will:</i>	
B.12.1 Show how cultures and individuals have contributed to the development of major ideas in the earth and space, life and environmental, and physical sciences	C.12.1 Demonstrate a working knowledge of leadership and leadership styles D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.5 Describe how biotechnology can enhance food and fiber production	

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

	E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity	
B.12.2 Identify the cultural conditions that are usually present during great periods of discovery, scientific development, and invention	D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.5 Describe how biotechnology can enhance food and fiber production	1 Identify food preference patterns and how they may differ between cultures. 2 Explain how income and culture impact food preference patterns. 3 Identify trends in food preference patterns. 4 Rank selected countries on per capita spending on food.
B.12.3 Relate the major themes of science to human progress in understanding science and the world	D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber	
B.12.4 Show how basic research and applied research contribute to new discoveries, inventions, and applications	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber	1. Identify key health issues related to fats and oils. 1 Describe organic farming. 2 Differentiate between organic and conventional production practices. 3 Identify the potential market for organic foods. 4 Identify organic foods based on labeling requirements. 5 Identify the states leading the U.S. in organic food production. 1 Understand the importance of supermarket inventory management. 2 Outline the product life cycle. 3 Describe the research and development process. 4 Explain the importance of packaging for new food products. 1 Define the utilities provided by the food marketing system.
B.12.5 Explain how science is based on assumptions about the natural world and themes that describe the natural world	D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries E.12.3 Explain the impact of climate change on existing	1 Identify food preference patterns and how they may differ between cultures. 2 Explain how income and culture impact food

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

	agricultural systems D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources	preference patterns. 3 Identify trends in food preference patterns. 4 Rank selected countries on per capita spending on food.
<b>C. SCIENCE INQUIRY</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<b><i>By the end of Grade 12 students will:</i></b>	<b><i>By the end of Grade 12 students will:</i></b>	
C.12.1 When studying science content, ask questions suggested by current social issues, scientific literature, and observations of phenomena; build hypotheses that might answer some of these questions; design possible investigations; and describe results that might emerge from such investigations	B.12.1 Apply knowledge of technology to identify and solve problems C.12.2 Practice skills relating to communication, problem-solving, and decision-making through individual, group, and team processes	Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating? Unit 1 Preserving It- Making it Ripe Lab What Makes It Safe? Lab Too Much of a Good Thing Lab A Wax Job Lab Keeping It Fresh Lab The Package Preserves It Lab A Death in the Ranks Lab Additive Analysis Lab Unit 2 How Sweet It Is Coke Float Lab The Sweeter It is Lab How Sweet Is Sweet? Lab The Sweets Make the Cake Lab Unit 3 The Fats in Foods How Much Fat Do You Eat? Lab Melting Promises Lab Rub A Dub Dub Lab The Fat Makes the Cake Lab Unit 4 Color Explosion Color Confusion Lab Kool-Aid Color Burst Lab To Be or Not To Be: The Food Color Question Lab Green Bean Color Change Lab The Color Eliminator Lab

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		Unit 5 Flavor Fascination The Wide World of Flavors Lab The No-Pecan Pecan Pie and No-Apple Apple Pie Lab The Nose Knows Lab The Case of the Unhealthy Diet Scenario
--	--	---

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

**Instructions:** Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.

<p>C.12.2 Identify issues from an area of science study, write questions that could be investigated, review previous research on these questions, and design and conduct responsible and safe investigations to help answer the questions</p>	<p>B.12.1 Apply knowledge of technology to identify and solve problems C.12.2 Practice skills relating to communication, problem-solving, and decision-making through individual, group, and team processes D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p>	<p>Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating? Unit 1 Preserving It-     Making it Ripe Lab     What Makes It Safe? Lab     Too Much of a Good Thing Lab     A Wax Job Lab     Keeping It Fresh Lab     The Package Preserves It Lab     A Death in the Ranks Lab     Additive Analysis Lab Unit 2 How Sweet It Is     Coke Float Lab     The Sweeter It Is Lab     How Sweet Is Sweet? Lab     The Sweets Make the Cake Lab Unit 3 The Fats in Foods     How Much Fat Do You Eat? Lab     Melting Promises Lab     Rub A Dub Dub Lab     The Fat Makes the Cake Lab Unit 4 Color Explosion     Color Confusion Lab     Kool-Aid Color Burst Lab     To Be or Not To Be: The Food Color Question Lab     Green Bean Color Change Lab     The Color Eliminator Lab Unit 5 Flavor Fascination     The Wide World of Flavors Lab     The No-Pecan Pecan Pie and No-Apple Apple Pie Lab     The Nose Knows Lab     The Case of the Unhealthy Diet Scenario</p>
<p>C.12.3 Evaluate the data collected during an investigation, critique the data-collection procedures and results, and suggest ways to make any needed improvements</p>	<p>B.12.1 Apply knowledge of technology to identify and solve problems B.12.3 Use technology to acquire, organize, and</p>	<p>1 Explain how calories relate to nutrition. 2 Explain claims made on food labels related to diet and health.</p>

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

	<p>communicate information by entering, modifying, retrieving, and storing data</p> <p>C.12.2 Practice skills relating to communication, problem-solving, and decision-making</p>	<p>3 Describe the Recommended Dietary Allowance (RDA).</p> <p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p> <p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p> <p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define “chemical food additive.”</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food preservatives.</p>
--	---	---



**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>3 Identify common types of chemical food preservatives.</p> <p>1 Describe methods of safely storing foods in the home.</p> <p>2 Identify potential food storage problems in homes.</p> <p>1 Describe methods of safely handling and preparing foods in the home.</p> <p>2 Describe the importance of cooking meats to the proper temperatures.</p> <p>3 Observe a meal being prepared in the home and identify potential safety issues.</p> <p>1 Describe the role of biotechnology in food science.</p> <p>2 Describe some future food products from improved crops.</p> <p>3 Describe the future of food-producing animals.</p> <p>Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating?</p> <p>Unit 1 Preserving It-</p> <p>    Making it Ripe Lab</p> <p>    What Makes It Safe? Lab</p> <p>    Too Much of a Good Thing Lab</p> <p>    A Wax Job Lab</p> <p>    Keeping It Fresh Lab</p> <p>    The Package Preserves It Lab</p> <p>    A Death in the Ranks Lab</p> <p>    Additive Analysis Lab</p> <p>Unit 2 How Sweet It Is</p> <p>    Coke Float Lab</p> <p>    The Sweeter It is Lab</p> <p>    How Sweet Is Sweet? Lab</p> <p>    The Sweets Make the Cake Lab</p> <p>Unit 3 The Fats in Foods</p> <p>    How Much Fat Do You Eat? Lab</p> <p>    Melting Promises Lab</p>
--	--	--

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		Rub A Dub Dub Lab The Fat Makes the Cake Lab Unit 4 Color Explosion Color Confusion Lab Kool-Aid Color Burst Lab To Be or Not To Be: The Food Color Question Lab Green Bean Color Change Lab The Color Eliminator Lab Unit 5 Flavor Fascination The Wide World of Flavors Lab The No-Pecan Pecan Pie and No-Apple Apple Pie Lab The Nose Knows Lab The Case of the Unhealthy Diet Scenario
C.12.4 During investigations, choose the best data-collection procedures and materials, use them competently, and calculate the degree of precision of the resulting data	B.12.1 Apply knowledge of technology to identify and solve problems B.12.3 Use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data C.12.2 Practice skills relating to communication, problem-solving, and decision-making	1 Explain the concept of food science. 2 Explain the importance of food science. 3 Identify the segments of the food industry. 1 Explain how calories relate to nutrition. 2 Explain claims made on food labels related to diet and health. 3 Describe the Recommended Dietary Allowance (RDA). 1 Describe methods of safely storing foods in the home. 2 Identify potential food storage problems in homes.  1 Describe methods of safely handling and preparing foods in the home. 2 Describe the importance of cooking meats to the proper temperatures. 3 Observe a meal being prepared in the home and identify potential safety issues. 1 Describe the role of biotechnology in food science. 2 Describe some future food products from improved crops. 3 Describe the future of food-producing animals.

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating?</p> <p>Unit 1 Preserving It-</p> <p>    Making it Ripe Lab</p> <p>    What Makes It Safe? Lab</p> <p>    Too Much of a Good Thing Lab</p> <p>    A Wax Job Lab</p> <p>    Keeping It Fresh Lab</p> <p>    The Package Preserves It Lab</p> <p>    A Death in the Ranks Lab</p> <p>    Additive Analysis Lab</p> <p>Unit 2 How Sweet It Is</p> <p>    Coke Float Lab</p> <p>    The Sweeter It is Lab</p> <p>    How Sweet Is Sweet? Lab</p> <p>    The Sweets Make the Cake Lab</p> <p>Unit 3 The Fats in Foods</p> <p>    How Much Fat Do You Eat? Lab</p> <p>    Melting Promises Lab</p> <p>    Rub A Dub Dub Lab</p> <p>    The Fat Makes the Cake Lab</p> <p>Unit 4 Color Explosion</p> <p>    Color Confusion Lab</p> <p>    Kool-Aid Color Burst Lab</p> <p>    To Be or Not To Be: The Food Color Question Lab</p> <p>    Green Bean Color Change Lab</p> <p>    The Color Eliminator Lab</p> <p>Unit 5 Flavor Fascination</p> <p>    The Wide World of Flavors Lab</p> <p>    The No-Pecan Pecan Pie and No-Apple Apple Pie Lab</p> <p>    The Nose Knows Lab</p> <p>    The Case of the Unhealthy Diet Scenario</p>
C.12.5 Use the explanations and models found in earth and space, life and environmental, and physical sciences to develop likely explanations for the results of their	B.12.2 Select and communicate information in an appropriate format; e.g., oral, written, graphic, pictorial, multimedia	<p>1 Explain the concept of food science.</p> <p>2 Explain the importance of food science.</p> <p>3 Identify the segments of the food industry.</p>

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

investigations	C.12.2 Practice skills relating to communication, problem-solving, and decision-making	<p>1 Identify effects of hydrogen bonding in water.  2 Demonstrate the chemical function of water as a dispersing medium.  3 Indicate differences between water activity and moisture of food.  4 Show characteristics of water that affect its use  1 Identify the chemical composition of lipids.  2 Recognize the differences between saturated and unsaturated fats.  3 Examine the chemical changes that fats can undergo.  4 Identify the functions of lipids in foods.  1 Identify chemical parts of a protein molecule.  2 Distinguish between conjugated proteins and nonconjugated proteins.  3 Recognize the different types of reactions of food proteins.  4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.  2 To identify simple carbohydrates.  3 To identify functional properties of monosaccharides.  4 To identify large complex carbohydrates.  5 To identify functional properties of large complex carbohydrates  1 Identify basic tastes.  2 Identify different flavor enhancing groups.  1 Define "chemical food additive."  2 Explain the functions of food additives.  3 Identify the classifications for food additives  1 Describe the function of chemical food preservatives.  2 Describe the mechanisms of chemical food preservatives.  3 Identify common types of chemical food preservatives.</p>
----------------	--	---

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>1 Explain the importance of food packaging.  2 Identify the characteristics of a good packaging material.  1 Identify the different materials and forms of food packages.  2 Explain the three different types of food packaging containers.  1 Explain the importance of food labels.  2 Identify foods affected by food labeling.  3 Identify foods exempt from food labels.</p> <p>1 Identify the parts of a food label.  2 Explain the format of a nutrition panel.  3 Define terms that may be found on a food label.  Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating?</p> <p>Unit 1 Preserving It-  Making it Ripe Lab  What Makes It Safe? Lab  Too Much of a Good Thing Lab  A Wax Job Lab  Keeping It Fresh Lab  The Package Preserves It Lab  A Death in the Ranks Lab  Additive Analysis Lab</p> <p>Unit 2 How Sweet It Is  Coke Float Lab  The Sweeter It is Lab  How Sweet Is Sweet? Lab  The Sweets Make the Cake Lab</p> <p>Unit 3 The Fats in Foods  How Much Fat Do You Eat? Lab  Melting Promises Lab  Rub A Dub Dub Lab  The Fat Makes the Cake Lab</p> <p>Unit 4 Color Explosion</p>
--	--	--

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		Color Confusion Lab Kool-Aid Color Burst Lab To Be or Not To Be: The Food Color Question Lab Green Bean Color Change Lab The Color Eliminator Lab Unit 5 Flavor Fascination The Wide World of Flavors Lab The No-Pecan Pecan Pie and No-Apple Apple Pie Lab The Nose Knows Lab The Case of the Unhealthy Diet Scenario
C.12.6 Present the results of investigations to groups concerned with the issues, explaining the meaning and implications of the results, and answering questions in terms the audience can understand	B.12.2 Select and communicate information in an appropriate format; e.g., oral, written, graphic, pictorial, multimedia B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology C.12.2 Practice skills relating to communication, problem-solving, and decision-making	Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating? Unit 1 Preserving It- Making it Ripe Lab What Makes It Safe? Lab Too Much of a Good Thing Lab A Wax Job Lab Keeping It Fresh Lab The Package Preserves It Lab A Death in the Ranks Lab Additive Analysis Lab Unit 2 How Sweet It Is Coke Float Lab The Sweeter It is Lab How Sweet Is Sweet? Lab The Sweets Make the Cake Lab Unit 3 The Fats in Foods How Much Fat Do You Eat? Lab Melting Promises Lab Rub A Dub Dub Lab The Fat Makes the Cake Lab Unit 4 Color Explosion Color Confusion Lab Kool-Aid Color Burst Lab To Be or Not To Be: The Food Color Question

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		Lab Green Bean Color Change Lab The Color Eliminator Lab Unit 5 Flavor Fascination The Wide World of Flavors Lab The No-Pecan Pecan Pie and No-Apple Apple Pie Lab The Nose Knows Lab The Case of the Unhealthy Diet Scenario
C.12.7 Evaluate articles and reports in the popular press, in scientific journals, on television, and on the Internet, using criteria related to accuracy, degree of error, sampling, treatment of data, and other standards of experimental design	B.12.1 Apply knowledge of technology to identify and solve problems B.12.2 Select and communicate information in an appropriate format; e.g., oral, written, graphic, pictorial, multimedia C.12.2 Practice skills relating to communication, problem-solving, and decision-making	Chemical Cuisine – A New World Dilemma, Tasty Chemical Mixture Lab, Do You Know What you are Eating? Unit 1 Preserving It- Making it Ripe Lab What Makes It Safe? Lab Too Much of a Good Thing Lab A Wax Job Lab Keeping It Fresh Lab The Package Preserves It Lab A Death in the Ranks Lab Additive Analysis Lab Unit 2 How Sweet It Is Coke Float Lab The Sweeter It is Lab How Sweet Is Sweet? Lab The Sweets Make the Cake Lab Unit 3 The Fats in Foods How Much Fat Do You Eat? Lab Melting Promises Lab Rub A Dub Dub Lab The Fat Makes the Cake Lab Unit 4 Color Explosion Color Confusion Lab Kool-Aid Color Burst Lab To Be or Not To Be: The Food Color Question Lab Lab Green Bean Color Change Lab The Color Eliminator Lab

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		Unit 5 Flavor Fascination The Wide World of Flavors Lab The No-Pecan Pecan Pie and No-Apple Apple Pie Lab The Nose Knows Lab The Case of the Unhealthy Diet Scenario
<b>D. PHYSICAL SCIENCE</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<i>By the end of Grade 12 students will:</i>	<i>By the end of Grade 12 students will:</i>	
<b>Structures of Atoms and Matter</b>		
D.12.1 Describe atomic structure and the properties of atoms, molecules, and matter during physical and chemical interactions	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	1 Identify effects of hydrogen bonding in water. 2 Demonstrate the chemical function of water as a dispersing medium. 3 Indicate differences between water activity and moisture of food. 4 Show characteristics of water that affect its use 1 Identify the chemical composition of lipids. 2 Recognize the differences between saturated and unsaturated fats. 3 Examine the chemical changes that fats can undergo. 4 Identify the functions of lipids in foods. 1 Identify chemical parts of a protein molecule. 2 Distinguish between conjugated proteins and nonconjugated proteins. 3 Recognize the different types of reactions of food proteins. 4 Identify functional properties of food proteins 1 To identify carbohydrates and their chemical composition. 2 To identify simple carbohydrates. 3 To identify functional properties of monosaccharides. 4 To identify large complex carbohydrates. 5 To identify functional properties of large complex carbohydrates 1 Identify basic tastes.



**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>2 Identify different flavor enhancing groups.  1 Define “chemical food additive.”  2 Explain the functions of food additives.  3 Identify the classifications for food additives  1 Describe the function of chemical food preservatives.  2 Describe the mechanisms of chemical food preservatives.  3 Identify common types of chemical food preservatives.</p>
D.12.2 Explain the forces that hold the atom together and illustrate how nuclear interactions change the atom	No significant match found	
D.12.3 Explain exchanges of energy in chemical interactions and exchange of mass and energy in atomic/nuclear reactions	<p>E.12.3 Explain the impact of climate change on existing agricultural systems  E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber  E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p>	

## Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and Wisconsin’s Model Academic Standards for Agricultural Education*

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

Chemical Reactions		
D.12.4 Explain how substances, both simple and complex, interact with one another to produce new substances	<p>D.12.5 Describe how biotechnology can enhance food and fiber production</p> <p>D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources</p> <p>E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber</p> <p>E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p>	<p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p> <p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p> <p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define “chemical food additive.”</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food preservatives.</p>

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		3 Identify common types of chemical food preservatives.
D.12.5 Identify patterns in chemical and physical properties and use them to predict likely chemical and physical changes and interactions	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber	1 Identify effects of hydrogen bonding in water. 2 Demonstrate the chemical function of water as a dispersing medium. 3 Indicate differences between water activity and moisture of food. 4 Show characteristics of water that affect its use 1 Identify the chemical composition of lipids. 2 Recognize the differences between saturated and unsaturated fats. 3 Examine the chemical changes that fats can undergo. 4 Identify the functions of lipids in foods.  1 Identify chemical parts of a protein molecule. 2 Distinguish between conjugated proteins and nonconjugated proteins. 3 Recognize the different types of reactions of food proteins. 4 Identify functional properties of food proteins 1 To identify carbohydrates and their chemical composition. 2 To identify simple carbohydrates. 3 To identify functional properties of monosaccharides. 4 To identify large complex carbohydrates. 5 To identify functional properties of large complex carbohydrates 1 Identify basic tastes. 2 Identify different flavor enhancing groups. 1 Define "chemical food additive." 2 Explain the functions of food additives. 3 Identify the classifications for food additives 1 Describe the function of chemical food preservatives. 2 Describe the mechanisms of chemical food

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>preservatives.</p> <p>3 Identify common types of chemical food preservatives.</p>
<p>D.12.6 Through investigations, identify the types of chemical interactions, including endothermic, exothermic, oxidation, photosynthesis, and acid/base reactions</p>	<p>D.12.5 Describe how biotechnology can enhance food and fiber production</p> <p>E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity</p> <p>E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber</p> <p>E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p>	<p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p> <p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p> <p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define “chemical food additive.”</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food</p>

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		preservatives. 3 Identify common types of chemical food preservatives.
<b>Motions and Forces</b>		
D.12.7 Qualitatively and quantitatively analyze changes in the motion of objects and the forces that act on them and represent analytical data both algebraically and graphically	No significant match found	
D.12.8 Understand the forces of gravitation, the electromagnetic force, and the intermolecular force, and explain their impact on the universal system	No significant match found	
D.12.9 Describe models of light, heat, and sound and through investigations describe similarities and differences in the way these energy forms behave	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	
<b>Conservation of Energy and the Increase in Disorder</b>		
D.12.10 Using the science themes, illustrate the law of conservation of energy during chemical and nuclear reactions	No significant match found	
<b>Interactions of Matter and Energy</b>		
D.12.11 Using the science themes, explain common occurrences in the physical world	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources E.12.3 Explain the impact of climate change on existing agricultural systems E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber	

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

**Instructions:** Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.

	E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	
D.12.12 Using the science themes and knowledge of chemical, physical, atomic and nuclear interactions, explain changes in materials, living things, the earth's features, and stars	<p>D.12.5 Describe how biotechnology can enhance food and fiber production</p> <p>D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources</p> <p>E.12.3 Explain the impact of climate change on existing agricultural systems</p> <p>E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber</p>	<p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p> <p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p> <p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define "chemical food additive."</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food preservatives.</p>

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		3 Identify common types of chemical food preservatives.
<b>E. EARTH AND SPACE SCIENCE</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<i>By the end of Grade 12 students will:</i>	<i>By the end of Grade 12 students will::</i>	
<b>Energy in the Earth System</b>		
E.12.1 Using the science themes, distinguish between internal energies (decay of radioactive isotopes, gravity) and external energies (sun) in the earth's systems and show how these sources of energy have an impact on those systems	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world. E 12.3 Explain the impact of climate change on existing agricultural systems	
<b>Geochemical Cycles</b>		
E.12.2 Analyze the geochemical and physical cycles of the earth and use them to describe movements of matter	D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world E 12.3 Explain the impact of climate change on existing agricultural systems	
<b>The Origin and Evolution of the Earth System</b>		
E.12.3: Using the science themes, describe theories of the origins and evolution of the universe and solar system, including the earth system as a part of the solar system, and relate these theories and their implications to geologic time on earth	E.12.2 Analyze benefits, costs, and consequences of land use E.12.3 Explain the impact of climate change on existing agricultural systems. E.12.4 Anaylze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity	
E.12.4 Analyze the benefits, costs, and limitations of past, present, and projected use of resources and technology and explain the consequences to the environment	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production. D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact.	

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

**Instructions:** Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.

	E.12.2 Analyze benefits, costs, and consequences of land use E.12.4 Anaylze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment.	
<b>The Origin and Evolution of the Universe</b>		
E.12.5 Using the science themes, understand that the origin of the universe is not completely understood, but that there are current ideas in science that attempt to explain its origin	No significant match	
<b>F. LIFE AND ENVIRONMENTAL SCIENCE</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<i>By the end of Grade 12 students will:</i>	<i>By the end of Grade 12 students will:</i>	
<b>The Cell</b>		
F.12.1 Evaluate the normal structures and the general and special functions of cells in single-celled and multiple-celled organisms	B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology D.12.5 Describe how biotechnology can enhance food and fiber production. D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact.	1 Identify effects of hydrogen bonding in water. 2 Demonstrate the chemical function of water as a dispersing medium. 3 Indicate differences between water activity and moisture of food. 4 Show characteristics of water that affect its use Describe the role of time and temperature in heat preservation. 1. Describe the process of canning. 1 Describe the use of dehydration as a food preservation method. 2 Describe the use of irradiation as a food preservation method. 3 Describe the use of chemical additives as a food preservation method. 1 Describe the fermentation process. 2 Describe the benefits of fermenting foods. 3 Identify common foods that are preserved by fermentation.



**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

F.12.2 Understand how cells differentiate and how cells are regulated	D.12.5 Describe how biotechnology can enhance food and fiber production. E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact	
<b>The Molecular Basis of Heredity</b>		
F.12.3 Explain current scientific ideas and information about the molecular and genetic basis of heredity	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact	
F.12.4 State the relationships between functions of the cell and functions of the organism as related to genetics and heredity	D.12.5 Describe how biotechnology can enhance food and fiber production. D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact	
<b>Biological Evolution</b>		
F.12.5 Understand the theory of evolution, natural selection, and biological classification	D.12.5 Describe how biotechnology can enhance food and fiber production. D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources.	
F.12.6 Using concepts of evolution and heredity, account for changes in species and the diversity of species, including the influence of these changes on science, e.g., breeding of plants or animals	D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have	

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

	on the food and fiber industries and natural resources E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact	
<b>The Interdependence of Organisms</b>		
F.12.7 Investigate how organisms both cooperate and compete in ecosystems	E.12.1 Understand the application of agricultural technolgies that can sustain production while reducing environmental impact E.12.2 Analyze benefits, costs, and consequences of land use E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment	

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

**Instructions:** Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.

<p>F.12.8 Using the science themes, infer changes in ecosystems prompted by the introduction of new species, environmental conditions, chemicals, and air, water, or earth pollution</p>	<p>D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources. E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact E.12.2 Analyze benefits, costs, and consequences of land use E.12.3 Explain the impact of climate change on existing agricultural systems E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p>	<p>1 Identify effects of hydrogen bonding in water. 2 Demonstrate the chemical function of water as a dispersing medium. 3 Indicate differences between water activity and moisture of food. 4 Show characteristics of water that affect its use 1 Identify the chemical composition of lipids. 2 Recognize the differences between saturated and unsaturated fats. 3 Examine the chemical changes that fats can undergo. 4 Identify the functions of lipids in foods. 1 Identify chemical parts of a protein molecule. 2 Distinguish between conjugated proteins and nonconjugated proteins. 3 Recognize the different types of reactions of food proteins. 4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition. 2 To identify simple carbohydrates. 3 To identify functional properties of monosaccharides. 4 To identify large complex carbohydrates. 5 To identify functional properties of large complex carbohydrates 1 Identify basic tastes. 2 Identify different flavor enhancing groups. 1 Define "chemical food additive." 2 Explain the functions of food additives. 3 Identify the classifications for food additives 1 Describe the function of chemical food preservatives. 2 Describe the mechanisms of chemical food preservatives. 3 Identify common types of chemical food preservatives.</p>
--	--	--

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

<b>Matter, Energy, and Organization in Living Systems</b>		
F.12.9 Using the science themes, investigate energy systems (related to food chains) to show how energy is stored in food (plants and animals) and how energy is released by digestion and metabolism	D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products E.12.3 Explain the impact of climate change on existing agricultural systems	
F.12.10 Understand the impact of energy on organisms in living systems	No significant match found	
F.12.11 Investigate how the complexity and organization of organisms accommodates the need for obtaining, transforming, transporting, releasing, and eliminating the matter and energy used to sustain an organism	D.12.1 Describe the global utilization of Wisconsin's food, fiber, and ornamental plant products D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world D.12.5 Describe how biotechnology can enhance food and fiber production. E.12.3 Explain the impact of climate change on existing agricultural systems	<p>1 Identify effects of hydrogen bonding in water.  2 Demonstrate the chemical function of water as a dispersing medium.  3 Indicate differences between water activity and moisture of food.  4 Show characteristics of water that affect its use  1 Identify the chemical composition of lipids.  2 Recognize the differences between saturated and unsaturated fats.  3 Examine the chemical changes that fats can undergo.  4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.  2 Distinguish between conjugated proteins and nonconjugated proteins.  3 Recognize the different types of reactions of food proteins.  4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.  2 To identify simple carbohydrates.  3 To identify functional properties of monosaccharides.  4 To identify large complex carbohydrates.  5 To identify functional properties of large complex carbohydrates  1 Identify basic tastes.</p>

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>2 Identify different flavor enhancing groups.  1 Define “chemical food additive.”  2 Explain the functions of food additives.  3 Identify the classifications for food additives  1 Describe the function of chemical food preservatives.  2 Describe the mechanisms of chemical food preservatives.  3 Identify common types of chemical food preservatives.</p>
<b>The Behavior of Organisms</b>		
F.12.12 Trace how the sensory and nervous systems of various organisms react to the internal and external environment and transmit survival or learning stimuli to cause changes in behavior or responses	<p>D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world  D.12.5 Describe how biotechnology can enhance food and fiber production  E.12.3 Explain the impact of climate change on existing agricultural systems</p>	
<b>G. SCIENCE APPLICATIONS</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<b><i>By the end of Grade 12 students will:</i></b>	<b><i>By the end of Grade 12 students will:</i></b>	
G.12.1 Identify personal interests in science and technology; account for implications that these interests might have for future education, and options to be considered	<p>D.12.4 Explore traditional and nontraditional food, fiber, and ornamental horticultural jobs/careers and identify the necessary skills, aptitudes, and abilities  B.12.5 Explore various career opportunities in the food, fiber, and natural resources industries using available forms of technology  B.12.6 Access information identifying the postsecondary education programs, both in and outside of Wisconsin, leading to careers in the food, fiber, and natural  F.12.4 Research a career in agricultural business marketing and management</p>	<p>1 Identify careers related to food science.  2 Describe the education and skills needed for a career in food science.  3 Identify the two main occupations involved in food science and the food science industry.</p>
G.12.2 Design, build, evaluate, and revise models and explanations related to the earth and space, life and environmental, and physical sciences	<p>D.12.2 Discuss the impact that climate and water have on the food, fiber, and ornamental horticulture production cycles throughout the world  E.12.3 Explain the impact of climate change on existing</p>	

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

**Instructions:** Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.

	agricultural systems E.12.4 Analyze practices used by farmers to reduce soil erosion and runoff to maintain soil fertility and productivity	
G.12.3 Analyze the costs, benefits, or problems resulting from a scientific or technological innovation, including implications for the individual and the community	<p>A.12.2 Understand the variety, complexity, and size of the agricultural industry in the world</p> <p>A.12.3 Describe how global interdependence benefits the production and distribution of food and fiber</p> <p>B.12.1 Apply knowledge of technology to identify and solve problems</p> <p>B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology</p> <p>D.12.5 Describe how biotechnology can enhance food and fiber production</p> <p>D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources</p> <p>E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact</p> <p>E.12.2 Analyze benefits, costs, and consequences of land use</p> <p>E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity</p> <p>E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber</p> <p>E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p>	<p>1 Explain the concept of food science.</p> <p>2 Explain the importance of food science.</p> <p>3 Identify the segments of the food industry.</p> <p>1 Describe the food service industry.</p> <p>2 Explain how food science and the food service industry are related.</p> <p>3 Identify trends related to the food service industry.</p> <p>1 Explain the importance of nutrition.</p> <p>2 Identify and describe the six major nutrients needed for good nutrition.</p> <p>1 Explain how calories relate to nutrition.</p> <p>2 Explain claims made on food labels related to diet and health.</p> <p>3 Describe the Recommended Dietary Allowance (RDA).</p> <p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p> <p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p> <p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p>

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define “chemical food additive.”</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food preservatives.</p> <p>3 Identify common types of chemical food preservatives.</p> <p>1 Describe food microbiology.</p> <p>2 Describe different types of microbes.</p> <p>3 Describe how microbes cause food spoilage</p> <p>1 Describe causes of food spoilage.</p> <p>2 Describe methods of preventing food spoilage.</p> <p>1 Describe the symptoms of food-borne illnesses.</p> <p>2 Describe the causes of food-borne illnesses.</p> <p>3 Describe prevention of food-borne illnesses.</p> <p>1 Describe methods of using heat to preserve food.</p> <p>2 Describe the role of time and temperature in heat preservation.</p> <p>3 Describe the process of canning.</p> <p>1 Describe the use of dehydration as a food preservation method.</p> <p>2 Describe the use of irradiation as a food preservation method.</p> <p>3 Describe the use of chemical additives as a food preservation method.</p> <p>1 Describe the fermentation process.</p>
--	--	--

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summary of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>2 Describe the benefits of fermenting foods.</p> <p>3 Identify common foods that are preserved by fermentation.</p> <p>1 Describe the importance of sanitation.</p> <p>2 Identify sources of contamination.</p> <p>3 Differentiate between cleaning and sanitizing</p> <p>1 Describe the importance of personal hygiene in food processing.</p> <p>2 Describe methods of demonstrating good personal hygiene habits</p> <p>1 Describe the importance of the cleanliness of food processing equipment.</p> <p>2 Identify factors that affect the cleanliness of food processing equipment.</p> <p>1 Describe the importance of cleanliness in a food processing plant.</p> <p>2 Identify factors that affect cleanliness in a food processing plant.</p> <p>1 Explain milk handling from the cow to the processing plant.</p> <p>2 Describe the processing of fluid milk.</p> <p>3 Describe the processing of milk products and by-products.</p> <p>1 Identify fluid milk products.</p> <p>2 Identify processed milk products.</p> <p>3 Distinguish milk products from non-dairy products.</p> <p>1 Describe proper handling of red meat prior to cooking.</p> <p>2 Explain recommended red meat cooking procedures.</p> <p>3 Identify recommended storage of cooked meats.</p> <p>1 Explain the difference between primal and retail cuts.</p> <p>2 Explain the process of determining whether meat is beef, veal, pork, or lamb.</p> <p>3 Identify beef and veal cuts.</p>
--	--	--



**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>4 Identify pork cuts.  5 Identify lamb cuts.  1 Explain slaughtering/harvesting.  2 Describe cutting, grinding, and blending meat.  3 Explain tenderizing processes (aging, cubing, chemical/electrical treatment, and marinating).  4 Describe preservation methods (dehydrating, curing, smoking, canning, freezing, freeze drying, and irradiating).  1 Become familiar with poultry meat production.  2 Describe the steps in processing poultry.  3 Describe the grading process for poultry and eggs.  4 Identify the parts of the egg.  5 Describe the steps in egg processing  1 List the general structure and composition of a grain seed.  2 Describe the grain milling process.  3 List the types of flour and explain their uses.  4 Describe the processing of breakfast cereals.  5 Explain the concept of "value-added" agriculture in terms of cereal grain  1 Identify the role of further processors.  2 Identify common food products made from cereal grains.  3 Identify industrial products made from cereal grains.  4 Explain the importance of industrial products in increasing the demand for cereal grains.  5 Identify the environmental benefits of using renewable resources for industrial products.  1 Identify general properties and characteristics of produce (fruits and vegetables).  2 Identify harvesting methods for produce.  3 Describe proper handling and storing of produce.  4 Identify enzyme activity detrimental to fruit and vegetable storage.  5 Identify alternative methods for preserving</p>
--	--	--

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>produce.</p> <p>1 Explain how sugar is produced.</p> <p>2 Define and classify confectioneries.</p> <p>3 Explain the process of sugar reduction and why it is important.</p> <p>4 Explain how chocolate is produced.</p> <p>5 Describe the confectionary manufacturing process.</p> <p>1 Identify the sources of fats and oils used in food processing.</p> <p>2 List the different properties of fats and oils.</p> <p>3 Describe the production and processing methods for fats and oils.</p> <p>4 List the essential fatty acids and explain why they are important.</p> <p>5 Identify key health issues related to fats and oils.</p> <p>1 Describe organic farming.</p> <p>2 Differentiate between organic and conventional production practices.</p> <p>3 Identify the potential market for organic foods.</p> <p>4 Identify organic foods based on labeling requirements.</p> <p>5 Identify the states leading the U.S. in organic food production.</p> <p>1 Understand the importance of supermarket inventory management.</p> <p>2 Outline the product life cycle.</p> <p>3 Describe the research and development process.</p> <p>4 Explain the importance of packaging for new food products</p> <p>1 Define the utilities provided by the food marketing system.</p> <p>2 Describe the functions provided by the food marketing system.</p> <p>3 List and define the 4 P’s of marketing.</p> <p>4 Describe the type of markets for food products.</p> <p>5 Explain the role of public food programs.</p> <p>1 Understand the terms “genetic engineering,”</p>
--	--	--

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>“GMO,” and “transgenic.”</p> <p>2 Learn how GMOs are created in the laboratory.</p> <p>3 Discover the uses of GMOs.</p> <p>4 Find out about the regulation of GMOs.</p> <p>5 Learn about the future of GMOs.</p> <p>1 Acquire a basic understanding of how GMOs are formed.</p> <p>2 Become familiar with the positive aspects of GMOs in food.</p> <p>3 Become familiar with the negative aspects of GMOs in food.</p> <p>4 Improve ability to debate issues for future leadership roles.</p> <p>5 Improve written communication skills.</p> <p>1 Describe methods of safely storing foods in the home.</p> <p>2 Identify potential food storage problems in homes.</p> <p>1 Describe methods of safely handling and preparing foods in the home.</p> <p>2 Describe the importance of cooking meats to the proper temperatures.</p> <p>3 Observe a meal being prepared in the home and identify potential safety issues.</p> <p>1 Describe the role of biotechnology in food science.</p> <p>2 Describe some future food products from improved crops.</p> <p>3 Describe the future of food-producing animals.</p>
G.12.4 Show how a major scientific or technological change has had an impact on work, leisure, or the home	<p>B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology</p> <p>D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources</p>	<p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p> <p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p>

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define “chemical food additive.”</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food preservatives.</p> <p>3 Identify common types of chemical food preservatives.</p> <p>1 Describe food microbiology.</p> <p>2 Describe different types of microbes.</p> <p>3 Describe how microbes cause food spoilage</p> <p>1 Describe causes of food spoilage.</p> <p>2 Describe methods of preventing food spoilage.</p> <p>1 Describe the symptoms of food-borne illnesses.</p> <p>2 Describe the causes of food-borne illnesses.</p> <p>3 Describe prevention of food-borne illnesses.</p> <p>1 Describe methods of using heat to preserve food.</p> <p>2 Describe the role of time and temperature in heat</p>
--	--	--

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>preservation.</p> <p>3 Describe the process of canning.</p> <p>1 Describe the use of dehydration as a food preservation method.</p> <p>2 Describe the use of irradiation as a food preservation method.</p> <p>3 Describe the use of chemical additives as a food preservation method.</p> <p>1 Describe the fermentation process.</p> <p>2 Describe the benefits of fermenting foods.</p> <p>3 Identify common foods that are preserved by fermentation.</p> <p>1 Describe the importance of sanitation.</p> <p>2 Identify sources of contamination.</p> <p>3 Differentiate between cleaning and sanitizing</p> <p>1 Describe the importance of personal hygiene in food processing.</p> <p>2 Describe methods of demonstrating good personal hygiene habits</p> <p>1 Describe the importance of the cleanliness of food processing equipment.</p> <p>2 Identify factors that affect the cleanliness of food processing equipment.</p> <p>1 Describe the importance of cleanliness in a food processing plant.</p> <p>2 Identify factors that affect cleanliness in a food processing plant.</p> <p>1 Explain milk handling from the cow to the processing plant.</p> <p>2 Describe the processing of fluid milk.</p> <p>3 Describe the processing of milk products and by-products.</p> <p>1 Identify fluid milk products.</p> <p>2 Identify processed milk products.</p> <p>3 Distinguish milk products from non-dairy products.</p> <p>1 Describe proper handling of red meat prior to</p>
--	--	---

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>cooking.</p> <p>2 Explain recommended red meat cooking procedures.</p> <p>3 Identify recommended storage of cooked meats.</p> <p>1 Explain the difference between primal and retail cuts.</p> <p>2 Explain the process of determining whether meat is beef, veal, pork, or lamb.</p> <p>3 Identify beef and veal cuts.</p> <p>4 Identify pork cuts.</p> <p>5 Identify lamb cuts.</p> <p>1 Explain slaughtering/harvesting.</p> <p>2 Describe cutting, grinding, and blending meat.</p> <p>3 Explain tenderizing processes (aging, cubing, chemical/electrical treatment, and marinating).</p> <p>4 Describe preservation methods (dehydrating, curing, smoking, canning, freezing, freeze drying, and irradiating).</p> <p>1 Become familiar with poultry meat production.</p> <p>2 Describe the steps in processing poultry.</p> <p>3 Describe the grading process for poultry and eggs.</p> <p>4 Identify the parts of the egg.</p> <p>5 Describe the steps in egg processing</p> <p>1 List the general structure and composition of a grain seed.</p> <p>2 Describe the grain milling process.</p> <p>3 List the types of flour and explain their uses.</p> <p>4 Describe the processing of breakfast cereals.</p> <p>5 Explain the concept of "value-added" agriculture in terms of cereal grain</p> <p>1 Identify the role of further processors.</p> <p>2 Identify common food products made from cereal grains.</p> <p>3 Identify industrial products made from cereal grains.</p> <p>4 Explain the importance of industrial products in increasing the demand for cereal grains.</p>
--	--	---

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>5 Identify the environmental benefits of using renewable resources for industrial products.</p> <p>1 Identify general properties and characteristics of produce (fruits and vegetables).</p> <p>2 Identify harvesting methods for produce.</p> <p>3 Describe proper handling and storing of produce.</p> <p>4 Identify enzyme activity detrimental to fruit and vegetable storage.</p> <p>5 Identify alternative methods for preserving produce.</p> <p>1 Explain how sugar is produced.</p> <p>2 Define and classify confectioneries.</p> <p>3 Explain the process of sugar reduction and why it is important.</p> <p>4 Explain how chocolate is produced.</p> <p>5 Describe the confectionary manufacturing process.</p> <p>1 Identify the sources of fats and oils used in food processing.</p> <p>2 List the different properties of fats and oils.</p> <p>3 Describe the production and processing methods for fats and oils.</p> <p>4 List the essential fatty acids and explain why they are important.</p> <p>5 Identify key health issues related to fats and oils.</p> <p>1 Describe organic farming.</p> <p>2 Differentiate between organic and conventional production practices.</p> <p>3 Identify the potential market for organic foods.</p> <p>4 Identify organic foods based on labeling requirements.</p> <p>5 Identify the states leading the U.S. in organic food production.</p> <p>1 Understand the importance of supermarket inventory management.</p> <p>2 Outline the product life cycle.</p> <p>3 Describe the research and development process.</p> <p>4 Explain the importance of packaging for new food</p>
--	--	---

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>products</p> <p>1 Define the utilities provided by the food marketing system.</p> <p>2 Describe the functions provided by the food marketing system.</p> <p>3 List and define the 4 P's of marketing.</p> <p>4 Describe the type of markets for food products.</p> <p>5 Explain the role of public food programs.</p> <p>1 Understand the terms “genetic engineering,” “GMO,” and “transgenic.”</p> <p>2 Learn how GMOs are created in the laboratory.</p> <p>3 Discover the uses of GMOs.</p> <p>4 Find out about the regulation of GMOs.</p> <p>5 Learn about the future of GMOs.</p> <p>1 Acquire a basic understanding of how GMOs are formed.</p> <p>2 Become familiar with the positive aspects of GMOs in food.</p> <p>3 Become familiar with the negative aspects of GMOs in food.</p> <p>4 Improve ability to debate issues for future leadership roles.</p> <p>5 Improve written communication skills.</p>
G.12.5 Choose a specific problem in our society, identify alternative scientific or technological solutions to that problem and argue its merits	B.12.1 Apply knowledge of technology to identify and solve problems	<p>1 Explain how calories relate to nutrition.</p> <p>2 Explain claims made on food labels related to diet and health.</p> <p>3 Describe the Recommended Dietary Allowance (RDA).</p>
<b>H. SCIENCE IN SOCIAL AND PERSONAL PERSPECTIVES</b>	<b>Agricultural Education Standards</b>	<b>Crosswalk of Local School Curriculum</b>
<b>Performance Standards</b>	<b>Performance Standards</b>	
<i>By the end of Grade 12 students will:</i>	<i>By the end of Grade 12 students will::</i>	
H.12.1 Using the science themes and knowledge of the earth and space, life and environmental, and physical sciences, analyze the costs, risks, benefits, and consequences of a proposal concerning resource	<p>A.12.1 Identify how political policies and issues shape and influence food and fiber systems</p> <p>A.12.3 Describe how global interdependence benefits the production and distribution of food and fiber</p>	<p>1 Explain the digestive process.</p> <p>2 Identify the parts of the human digestive system.</p> <p>3 Identify secretions and enzymes that aid in the digestive process.</p>



## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

**Instructions:** Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.

management in the community and determine the potential impact of the proposal on life in the community and the region	<p>D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries cite examples of conflicts between environmentalists and producers of food and fiber</p> <p>E.12.1 Understand the application of agricultural technologies that can sustain production while reducing environmental impact</p> <p>E.12.2 Analyze benefits, costs, and consequences of land use</p> <p>E.12.3 Explain the impact of climate change on existing agricultural systems</p> <p>E.12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity</p> <p>E.12.5 Analyze the impact and use of chemicals in the production and processing of food and fiber</p> <p>E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p>	<p>4 Identify types of digestive system disorders.</p> <p>1 Identify the agencies that oversee food additive and food safety regulations.</p> <p>2 Identify the primary laws/regulations related to food additives and food safety.</p> <p>3 Describe the process for approving a food additive.</p> <p>4 Describe recent controversies over food additives.</p> <p>1 Identify food preference patterns and how they may differ between cultures.</p> <p>2 Explain how income and culture impact food preference patterns.</p> <p>3 Identify trends in food preference patterns.</p> <p>4 Rank selected countries on per capita spending on food.</p>
H.12.2 Evaluate proposed policy recommendations (local, state, and/or national) in science and technology for validity, evidence, reasoning, and implications, both short and long term	<p>A.12.1 Identify how political policies and issues shape and influence food and fiber</p> <p>Systems</p> <p>B.12.1 Apply knowledge of technology to identify and solve problems</p> <p>C.12.2 Practice skills relating to communication, problem-solving, and decision-making through individual, group, and team processes</p> <p>D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries</p> <p>E.12.2 Analyze benefits, costs, and consequences of land use</p> <p>F.12.1 Describe how the production, distribution, and marketing of food and fiber is part of a complex economic system</p>	<p>1 Explain the concept of food science.</p> <p>2 Explain the importance of food science.</p> <p>3 Identify the segments of the food industry.</p> <p>1 Explain the digestive process.</p> <p>2 Identify the parts of the human digestive system.</p> <p>3 Identify secretions and enzymes that aid in the digestive process.</p> <p>4 Identify types of digestive system disorders.</p> <p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p> <p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p> <p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p>

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define “chemical food additive.”</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food preservatives.</p> <p>3 Identify common types of chemical food preservatives.</p> <p>1 Identify the agencies that oversee food additive and food safety regulations.</p> <p>2 Identify the primary laws/regulations related to food additives and food safety.</p> <p>3 Describe the process for approving a food additive.</p> <p>4 Describe recent controversies over food additives.</p> <p>1 Describe methods of safely storing foods in the home.</p> <p>2 Identify potential food storage problems in homes.</p>
--	--	--

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>1 Describe methods of safely handling and preparing foods in the home.</p> <p>2 Describe the importance of cooking meats to the proper temperatures.</p> <p>3 Observe a meal being prepared in the home and identify potential safety issues.</p> <p>1 Describe the role of biotechnology in food science.</p> <p>2 Describe some future food products from improved crops.</p> <p>3 Describe the future of food-producing animals.</p> <p>1 Identify food preference patterns and how they may differ between cultures.</p> <p>2 Explain how income and culture impact food preference patterns.</p> <p>3 Identify trends in food preference patterns.</p> <p>4 Rank selected countries on per capita spending on food.</p>
H.12.3 Show how policy decisions in science depend on many factors, including social values, ethics, beliefs, and time-frames, and considerations of science and technology	<p>A.12.1 Identify how political policies and issues shape and influence food and fiber systems</p> <p>B.12.1 Apply knowledge of technology to identify and solve problems</p> <p>D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries</p> <p>E.12.2 Analyze benefits, costs, and consequences of land use</p> <p>E.12.6 Analyze benefits, costs, and consequences of processing food and fiber on the environment</p> <p>F.12.1 Describe how the production, distribution, and marketing of food and fiber is part of a complex economic system</p>	<p>1 Explain the digestive process.</p> <p>2 Identify the parts of the human digestive system.</p> <p>3 Identify secretions and enzymes that aid in the digestive process.</p> <p>4 Identify types of digestive system disorders.</p> <p>1 Explain how calories relate to nutrition.</p> <p>2 Explain claims made on food labels related to diet and health.</p> <p>3 Describe the Recommended Dietary Allowance (RDA).</p> <p>1 Describe methods of safely storing foods in the home.</p> <p>2 Identify potential food storage problems in homes.</p> <p>1 Describe methods of safely handling and preparing foods in the home.</p> <p>2 Describe the importance of cooking meats to the proper temperatures.</p>

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>3 Observe a meal being prepared in the home and identify potential safety issues.</p> <p>1 Describe the role of biotechnology in food science.</p> <p>2 Describe some future food products from improved crops.</p> <p>3 Describe the future of food-producing animals.</p> <p>1 Identify food preference patterns and how they may differ between cultures.</p> <p>2 Explain how income and culture impact food preference patterns.</p> <p>3 Identify trends in food preference patterns.</p> <p>4 Rank selected countries on per capita spending on food.</p>
--	--	---

## Crosswalk Between: *Wisconsin's Model Academic Standards for Science and Wisconsin's Model Academic Standards for Agricultural Education*

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

<p>H.12.4 Advocate a solution or combination of solutions to a problem in science or technology</p>	<p>B.12.1 Apply knowledge of technology to identify and solve problems D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries D.12.5 Describe how biotechnology can enhance food and fiber production D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources</p>	<p>1 Identify effects of hydrogen bonding in water. 2 Demonstrate the chemical function of water as a dispersing medium. 3 Indicate differences between water activity and moisture of food. 4 Show characteristics of water that affect its use 1 Identify the chemical composition of lipids. 2 Recognize the differences between saturated and unsaturated fats. 3 Examine the chemical changes that fats can undergo. 4 Identify the functions of lipids in foods. 1 Identify chemical parts of a protein molecule. 2 Distinguish between conjugated proteins and nonconjugated proteins. 3 Recognize the different types of reactions of food proteins. 4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition. 2 To identify simple carbohydrates. 3 To identify functional properties of monosaccharides. 4 To identify large complex carbohydrates. 5 To identify functional properties of large complex carbohydrates 1 Identify basic tastes. 2 Identify different flavor enhancing groups. 1 Define "chemical food additive." 2 Explain the functions of food additives. 3 Identify the classifications for food additives 1 Describe the function of chemical food preservatives. 2 Describe the mechanisms of chemical food preservatives. 3 Identify common types of chemical food preservatives.</p>
---	---	--

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>1 Identify the agencies that oversee food additive and food safety regulations.</p> <p>2 Identify the primary laws/regulations related to food additives and food safety.</p> <p>3 Describe the process for approving a food additive.</p> <p>4 Describe recent controversies over food additives.</p> <p>1 Describe methods of safely storing foods in the home.</p> <p>2 Identify potential food storage problems in homes.</p> <p>1 Describe methods of safely handling and preparing foods in the home.</p> <p>2 Describe the importance of cooking meats to the proper temperatures.</p> <p>3 Observe a meal being prepared in the home and identify potential safety issues.</p> <p>1 Describe the role of biotechnology in food science.</p> <p>2 Describe some future food products from improved crops.</p> <p>3 Describe the future of food-producing animals.</p> <p>1 Identify food preference patterns and how they may differ between cultures.</p> <p>2 Explain how income and culture impact food preference patterns.</p> <p>3 Identify trends in food preference patterns.</p> <p>4 Rank selected countries on per capita spending on food.</p>
H.12.5 Investigate how current plans or proposals concerning resource management, scientific knowledge, or technological development will have an impact on the environment, ecology, and quality of life in a community or region	<p>A.12.1 Identify how political policies and issues shape and influence food and fiber systems</p> <p>A.12.3 Describe how global interdependence benefits the production and distribution of food and fiber</p> <p>B.12.1 Apply knowledge of technology to identify and solve problems</p> <p>D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries</p>	<p>1 Explain the digestive process.</p> <p>2 Identify the parts of the human digestive system.</p> <p>3 Identify secretions and enzymes that aid in the digestive process.</p> <p>4 Identify types of digestive system disorders.</p> <p>1 Explain how calories relate to nutrition.</p> <p>2 Explain claims made on food labels related to diet</p>

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

	<p>D.12.6 Understand the impact emerging technologies within hydroponics, aquaculture, and biotechnology have on the food and fiber industries and natural resources</p> <p>E.12.2 Analyze benefits, costs, and consequences of land use</p> <p>E 12.4 Analyze practices used by farmers to reduce erosion and runoff to maintain soil fertility and productivity</p>	<p>and health.</p> <p>3 Describe the Recommended Dietary Allowance (RDA).</p> <p>1 Identify the agencies that oversee food additive and food safety regulations.</p> <p>2 Identify the primary laws/regulations related to food additives and food safety.</p> <p>3 Describe the process for approving a food additive.</p> <p>4 Describe recent controversies over food additives.</p> <p>1 Describe methods of safely storing foods in the home.</p> <p>2 Identify potential food storage problems in homes.</p> <p>1 Describe methods of safely handling and preparing foods in the home.</p> <p>2 Describe the importance of cooking meats to the proper temperatures.</p> <p>3 Observe a meal being prepared in the home and identify potential safety issues.</p> <p>1 Describe the role of biotechnology in food science.</p> <p>2 Describe some future food products from improved crops.</p> <p>3 Describe the future of food-producing animals.</p> <p>1 Identify food preference patterns and how they may differ between cultures.</p> <p>2 Explain how income and culture impact food preference patterns.</p> <p>3 Identify trends in food preference patterns.</p> <p>4 Rank selected countries on per capita spending on food.</p>
H.12.6 Evaluate data and sources of information when using scientific information to make decisions.	B.12.3 Use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data	<p>1 Identify effects of hydrogen bonding in water.</p> <p>2 Demonstrate the chemical function of water as a dispersing medium.</p>

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

	<p>B.12.4 Access and use information for a class presentation about the impact of new technologies on the products manufactured and produced; e.g., biotechnology</p> <p>D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries</p>	<p>3 Indicate differences between water activity and moisture of food.</p> <p>4 Show characteristics of water that affect its use</p> <p>1 Identify the chemical composition of lipids.</p> <p>2 Recognize the differences between saturated and unsaturated fats.</p> <p>3 Examine the chemical changes that fats can undergo.</p> <p>4 Identify the functions of lipids in foods.</p> <p>1 Identify chemical parts of a protein molecule.</p> <p>2 Distinguish between conjugated proteins and nonconjugated proteins.</p> <p>3 Recognize the different types of reactions of food proteins.</p> <p>4 Identify functional properties of food proteins</p> <p>1 To identify carbohydrates and their chemical composition.</p> <p>2 To identify simple carbohydrates.</p> <p>3 To identify functional properties of monosaccharides.</p> <p>4 To identify large complex carbohydrates.</p> <p>5 To identify functional properties of large complex carbohydrates</p> <p>1 Identify basic tastes.</p> <p>2 Identify different flavor enhancing groups.</p> <p>1 Define “chemical food additive.”</p> <p>2 Explain the functions of food additives.</p> <p>3 Identify the classifications for food additives</p> <p>1 Describe the function of chemical food preservatives.</p> <p>2 Describe the mechanisms of chemical food preservatives.</p> <p>3 Identify common types of chemical food preservatives.</p> <p>1 Describe food microbiology.</p> <p>2 Describe different types of microbes.</p> <p>3 Describe how microbes cause food spoilage</p>
--	---	---



**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<ul style="list-style-type: none"> <li>1 Describe causes of food spoilage.</li> <li>2 Describe methods of preventing food spoilage.</li> <li>1 Describe the symptoms of food-borne illnesses.</li> <li>2 Describe the causes of food-borne illnesses.</li> <li>3 Describe prevention of food-borne illnesses.</li> <li>1 Describe methods of using heat to preserve food.</li> <li>2 Describe the role of time and temperature in heat preservation.</li> <li>3 Describe the process of canning.</li> <li>1 Describe the use of dehydration as a food preservation method.</li> <li>2 Describe the use of irradiation as a food preservation method.</li> <li>3 Describe the use of chemical additives as a food preservation method.</li> <li>1 Describe the fermentation process.</li> <li>2 Describe the benefits of fermenting foods.</li> <li>3 Identify common foods that are preserved by fermentation.</li> <li>1 Describe the importance of sanitation.</li> <li>2 Identify sources of contamination.</li> <li>3 Differentiate between cleaning and sanitizing</li> <li>1 Describe the importance of personal hygiene in food processing.</li> <li>2 Describe methods of demonstrating good personal hygiene habits</li> <li>1 Describe the importance of the cleanliness of food processing equipment.</li> <li>2 Identify factors that affect the cleanliness of food processing equipment.</li> <li>1 Describe the importance of cleanliness in a food processing plant.</li> <li>2 Identify factors that affect cleanliness in a food processing plant.</li> <li>1 Explain milk handling from the cow to the processing plant.</li> <li>2 Describe the processing of fluid milk.</li> <li>3 Describe the processing of milk products and by-</li> </ul>
--	--	--

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>products.</p> <ol style="list-style-type: none"> <li>1 Identify fluid milk products.</li> <li>2 Identify processed milk products.</li> <li>3 Distinguish milk products from non-dairy products.</li> <li>1 Describe proper handling of red meat prior to cooking.</li> <li>2 Explain recommended red meat cooking procedures.</li> <li>3 Identify recommended storage of cooked meats.</li> <li>1 Explain the difference between primal and retail cuts.</li> <li>2 Explain the process of determining whether meat is beef, veal, pork, or lamb.</li> <li>3 Identify beef and veal cuts.</li> <li>4 Identify pork cuts.</li> <li>5 Identify lamb cuts.</li> <li>1 Explain slaughtering/harvesting.</li> <li>2 Describe cutting, grinding, and blending meat.</li> <li>3 Explain tenderizing processes (aging, cubing, chemical/electrical treatment, and marinating).</li> <li>4 Describe preservation methods (dehydrating, curing, smoking, canning, freezing, freeze drying, and irradiating).</li> <li>1 Become familiar with poultry meat production.</li> <li>2 Describe the steps in processing poultry.</li> <li>3 Describe the grading process for poultry and eggs.</li> <li>4 Identify the parts of the egg.</li> <li>5 Describe the steps in egg processing</li> <li>1 List the general structure and composition of a grain seed.</li> <li>2 Describe the grain milling process.</li> <li>3 List the types of flour and explain their uses.</li> <li>4 Describe the processing of breakfast cereals.</li> <li>5 Explain the concept of “value-added” agriculture in terms of cereal grain</li> </ol>
--	--	---

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<ul style="list-style-type: none"> <li>1 Identify the role of further processors.</li> <li>2 Identify common food products made from cereal grains.</li> <li>3 Identify industrial products made from cereal grains.</li> <li>4 Explain the importance of industrial products in increasing the demand for cereal grains.</li> <li>5 Identify the environmental benefits of using renewable resources for industrial products.</li> <li>1 Identify general properties and characteristics of produce (fruits and vegetables).</li> <li>2 Identify harvesting methods for produce.</li> <li>3 Describe proper handling and storing of produce.</li> <li>4 Identify enzyme activity detrimental to fruit and vegetable storage.</li> <li>5 Identify alternative methods for preserving produce.</li> <li>1 Explain how sugar is produced.</li> <li>2 Define and classify confectioneries.</li> <li>3 Explain the process of sugar reduction and why it is important.</li> <li>4 Explain how chocolate is produced.</li> <li>5 Describe the confectionary manufacturing process.</li> <li>1 Identify the sources of fats and oils used in food processing.</li> <li>2 List the different properties of fats and oils.</li> <li>3 Describe the production and processing methods for fats and oils.</li> <li>4 List the essential fatty acids and explain why they are important.</li> <li>5 Identify key health issues related to fats and oils.</li> <li>1 Describe organic farming.</li> <li>2 Differentiate between organic and conventional production practices.</li> <li>3 Identify the potential market for organic foods.</li> <li>4 Identify organic foods based on labeling requirements.</li> </ul>
--	--	---

**Crosswalk Between: *Wisconsin’s Model Academic Standards for Science and  
Wisconsin’s Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin’s Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		<p>5 Identify the states leading the U.S. in organic food production.</p> <p>1 Understand the importance of supermarket inventory management.</p> <p>2 Outline the product life cycle.</p> <p>3 Describe the research and development process.</p> <p>4 Explain the importance of packaging for new food products</p> <p>1 Define the utilities provided by the food marketing system.</p> <p>2 Describe the functions provided by the food marketing system.</p> <p>3 List and define the 4 P’s of marketing.</p> <p>4 Describe the type of markets for food products.</p> <p>5 Explain the role of public food programs.</p> <p>1 Understand the terms “genetic engineering,” “GMO,” and “transgenic.”</p> <p>2 Learn how GMOs are created in the laboratory.</p> <p>3 Discover the uses of GMOs.</p> <p>4 Find out about the regulation of GMOs.</p> <p>5 Learn about the future of GMOs.</p> <p>1 Acquire a basic understanding of how GMOs are formed.</p> <p>2 Become familiar with the positive aspects of GMOs in food.</p> <p>3 Become familiar with the negative aspects of GMOs in food.</p> <p>4 Improve ability to debate issues for future leadership roles.</p> <p>5 Improve written communication skills.</p> <p>1 Identify food preference patterns and how they may differ between cultures.</p> <p>2 Explain how income and culture impact food preference patterns.</p> <p>3 Identify trends in food preference patterns.</p> <p>4 Rank selected countries on per capita spending on food.</p> <p>Chemical Cuisine – A New World Dilemma, Tasty</p>
--	--	---

**Crosswalk Between: *Wisconsin's Model Academic Standards for Science and  
Wisconsin's Model Academic Standards for Agricultural Education***

*Instructions: Please fill out the third column illustrating how the proposed agriculture class meets the state standards in the first two columns. Information in the third column should include knowledge, concepts and skills, and a summery of the equivalent instructional time for the equivalent course. The first column lists Wisconsin's Model Academic Standards for Science. Column two illustrates the various agriculture performance standards that have been crosswalked to the science performance standards in the first column.*

		Chemical Mixture Lab, Do You Know What you are Eating?
H.12.7 When making decisions, construct a plan that includes the use of current scientific knowledge and scientific reasoning.	B.12.3 Use technology to acquire, organize, and communicate information by entering, modifying, retrieving, and storing data D.12.3 Understand how public policy affects the food, fiber, and ornamental plant industries	<p>1 Identify food preference patterns and how they may differ between cultures.</p> <p>2 Explain how income and culture impact food preference patterns.</p> <p>3 Identify trends in food preference patterns.</p> <p>4 Rank selected countries on per capita spending on food.</p>

j:\data\bevshell\ag science activities\agscience crosswalk.doc